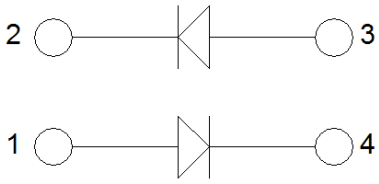
MSC2X101_100DC120J SiC Diode Power Module

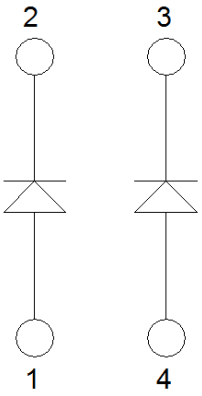
1 Product Overview

This section provides the product overview for the MSC2X101_100DC120J device.



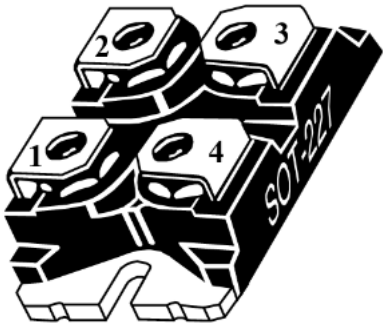
Anti-Parallel

MSC2X100DC120J



Parallel

MSC2X101DC120J



All ratings at T_j = 25 °C, unless otherwise specified.

Caution: These devices are sensitive to electrostatic discharge. Proper handling procedures should be followed.

1.1 Features

The following are key features of the MSC2X101_100DC120J device:

- Silicon carbide (SiC) Schottky diode
  - Zero reverse recovery
  - Zero forward recovery
  - Temperature-independent switching behavior
  - Positive temperature coefficient on VF
- Very low stray inductance

1.2 Benefits

The following are benefits of the MSC2X101_100DC120J device:

- Outstanding performance at high-frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction-to-case thermal resistance
- RoHS compliant

1.3 Applications

The MSC2X101_100DC120J device is designed for the following applications:

- Uninterruptible power supply (UPS)
- Induction heating
- Welding equipment
- High-speed rectifiers

2 Electrical Specifications

This section provides the electrical specifications for the MSC2X101_100DC120J device.

2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per diode for the MSC2X101_100DC120J device.

Table 1 • Absolute Maximum Ratings

Symbol	Parameter		Maximum Ratings	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
I_F	DC forward current	T_C = 100 °C	100	A

The following table shows the thermal and package characteristics of the MSC2X101_100DC120J.

Table 2 • Thermal and Package Characteristics

Symbol	Characteristic	Min	Typ	Max	Unit
V_{ISOL}	RMS isolation voltage, any terminal to case t =1 minute, 50 Hz/60 Hz	2500			V
T_JT_{STG}	Storage temperature range	–55		175	°C
T_{JOP}	Recommended junction temperature under switching conditions	–55		T_{Jmax}–25	
Torque	Terminal and mounting screws			1.1	N.m
Wt	Package weight		29.2		g

2.2 Electrical Performance

The following table shows the electrical characteristics per diode of the MSC2X101_100DC120J.

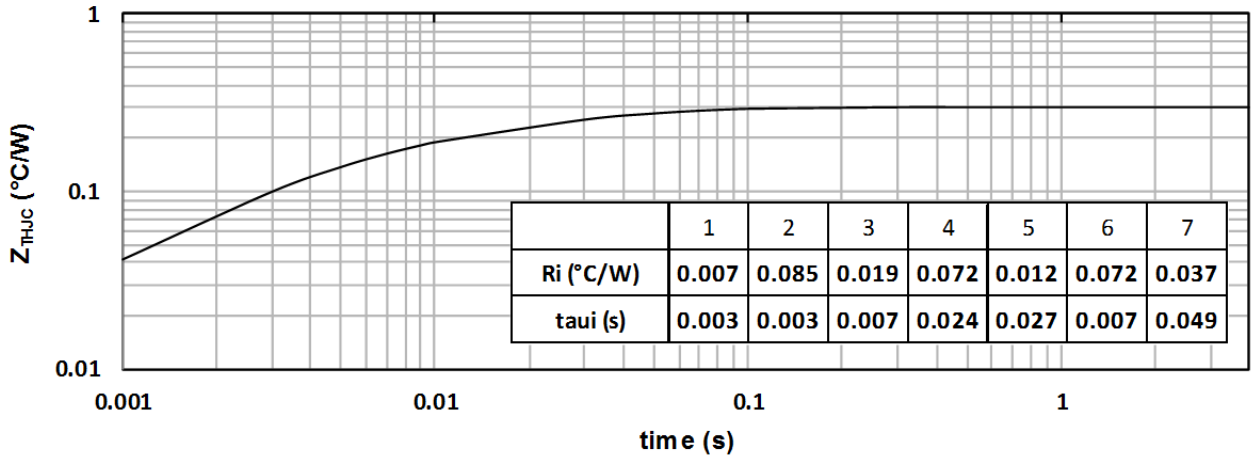
Table 3 • Electrical Characteristics Per Diode

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_F	Diode forward voltage	I_F = 100 A	T_j = 25 °C		1.5	1.8	V
			T_j = 175 °C		2.1		
I_{RM}	Reverse leakage current	V_R = 1200 V	T_j = 25 °C		30	400	µA
			T_j = 175 °C		500		
Q_C	Total capacitive charge	V_R = 600 V			448		nC
C	Total capacitance	f = 1 MHz, V_R = 400 V			492		pF
		f = 1 MHz, V_R = 800 V			364		
R_{thJC}	Junction-to-case thermal resistance					0.304	°C/W

2.3 Performance Curves

This section shows the typical performance curves for the MSC2X101_100DC120J device.

Figure 1 • Maximum Transient Thermal Impedance



	1	2	3	4	5	6	7
Ri (°C/W)	0.007	0.085	0.019	0.072	0.012	0.072	0.037
taui (s)	0.003	0.003	0.007	0.024	0.027	0.007	0.049

Figure 2 • Forward Current vs. Forward Voltage

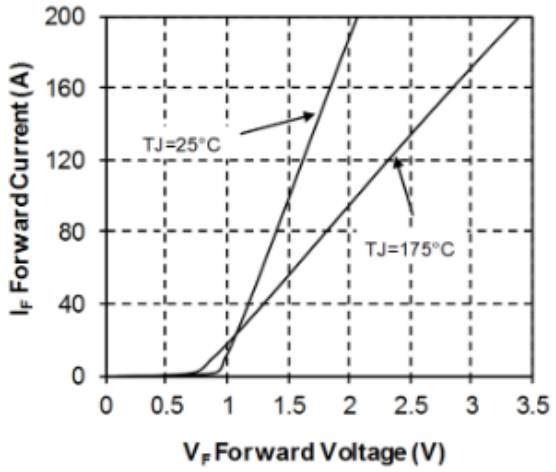
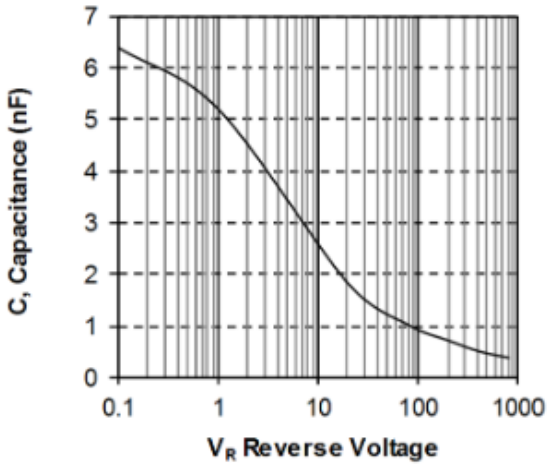


Figure 3 • Capacitance vs. Reverse Voltage



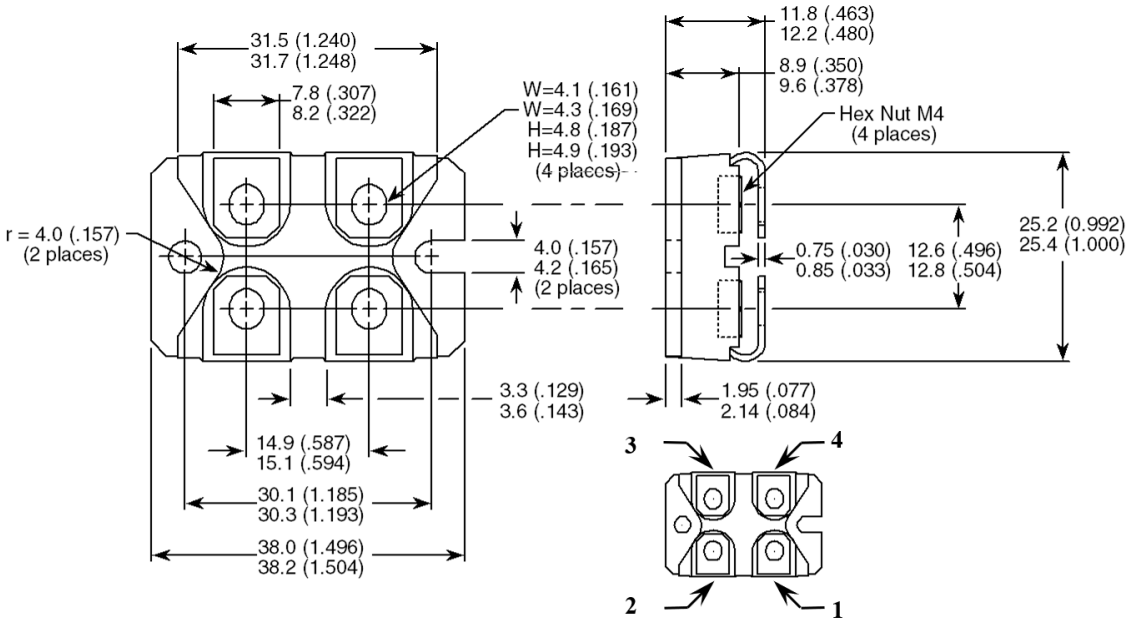
3 Package Specifications

This section shows the package specifications for the MSC2X101_100DC120J device.

3.1 Package Outline Drawing

The following drawing shows the package outline of the MSC2X101_100DC120J device. The dimensions in the following figure are in millimeters.

Figure 4 • Package Outline Drawing



Dimensions in Millimeters and (Inches)

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